

## PATENT ABSTRACTS OF JAPAN

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(54) INTERNAL FIXING TYPE ARTIFICIAL BLOOD VESSEL AND SET FOR  
TRANSPLANTATION INCLUDING THE SAME

(57)Abstract:

PURPOSE: To provide the internal fixing type artificial blood vessel which can be easily bonded to a blood vessel to be bonded even if the blood vessel is slightly damaged or slightly inflamed and the set for transplantation using this artificial blood vessel.

CONSTITUTION: The internal fixing type artificial blood vessel consists of an artificial blood vessel body,  $\geq 1$  hard cylindrical members provided at its end and arbitrary points at need and a tube provided on the cylindrical members. The set for transplantation including this artificial blood vessel is provided.

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**CLAIMS**

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**[Claim(s)]**

[Claim 1] The internal-fixation mold artificial blood vessel characterized by consisting of balun prepared on the artificial blood vessel body, the hard cylinder member prepared in the edge, and said cylinder member.

[Claim 2] The internal-fixation mold artificial blood vessel characterized by consisting of balun prepared on the hard cylinder member prepared in an artificial blood vessel body, its edge, and an arbitration part, and said cylinder member.

[Claim 3] The set for internal-fixation mold synthetic graft which consists of the transfer pipet and said bulking agent for pouring a bulking agent into claim 1 and/or an internal-fixation mold artificial blood vessel given in two, and said balun.

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[Translation done.]

**DETAILED DESCRIPTION**

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**[Detailed Description of the Invention]**

**[0001]**

[Industrial Application] This invention inserts an artificial blood vessel inside a blood vessel, and relates to the set for transplantation for using the internal-fixation mold artificial blood vessel for binding said artificial blood vessel to a blood vessel completely, and it.

**[0002]**

[Description of the Prior Art] Conventionally, it is the approach (refer to drawing 2 ) of

inserting the approach (referring to drawing 1 ) of suturing a blood vessel and an artificial blood vessel in the first place, and the artificial blood vessel which has [ second ] a hard cylinder member at the edge into a blood vessel as a means to bind a blood vessel and an artificial blood vessel, and banding together with yarn or a wire from on the. However, any approach must exfoliate an artificial blood vessel and the perimeter of a blood vessel which is going to suture or band together. When a blood vessel is brittle or inflammation and infection are produced, a blood vessel wall cannot be exfoliated well, but a suture and union become difficult in many cases.

[0003]

[Objects of the Invention] The purpose of this invention is in the point of offering the set for transplantation which used inflammation, the internal-fixation mold artificial blood vessel which can be easily bound even if infected, and it, somewhat, even if the blood vessel which should be bound to an artificial blood vessel is damaged somewhat.

[0004]

[Elements of the Invention] The 1st of this invention is related with the internal-fixation mold artificial blood vessel characterized by consisting of balun prepared on the artificial blood vessel body, the hard cylinder member prepared in the edge, and said cylinder member. The 2nd of this invention is related with the internal-fixation mold artificial blood vessel characterized by consisting of balun prepared on two or more hard cylinder members prepared in an artificial blood vessel body, its edge, and an arbitration part, and said cylinder member. The 3rd of this invention is related with the set for internal-fixation mold synthetic graft which consists of the transfer pipet and said bulking agent for pouring a bulking agent into said internal-fixation mold artificial blood vessel and said balun.

[0005] There is no limit according to rank in the artificial blood vessel used by this invention, and Teflon, dacron (trade name), GOATEKKUSU (trade name), etc. can use it for it by any artificial blood vessel by which current use is carried out. Also about the hard cylinder member combined with the edge, there is no limit according to rank and any cylinder member by which current use is carried out can use it. Balun expands with a bulking agent and said balun carries out the operation stuck to the wall of a blood vessel by pressure to extent which is extent from which blood does not leak and does not damage a blood vessel, when it is the important member of this invention and a bulking agent is poured in with transfer pipet into this balun. As for said hard cylinder member side of balun, being fixed with the means of arbitration is desirable. For example, it can paste up with suitable adhesives. Nature or synthetic rubber can be used that what is necessary is just that to which balun is equal to said expansion

enough as a component of balun. As synthetic rubber, the copolymer of the polymerization of diene system monomers, such as a butadiene and an isoprene, or a copolymer, said diene system monomer like SBR, and olefin system monomers, such as styrene, silicone system rubber, polyurethane, these fluorine atom content rubber, etc. can be mentioned. It is this better \*\* that does not have a possibility of generating the coagulation of blood when especially such ingredients and blood contact. If toxicity is not shown even if it should be liquefied at the time of impregnation and should contact blood as said bulking agent at it, there will be especially no limit. For example, it may be liquefied also at the time of the time of impregnation, and use, and may be liquefied at the time of impregnation, or the thing of the shape of gel or a solid-state may be used at the time of use. In this case, it is important that the direction at the time of the shape of gel or a solid-state chooses from the liquefied time that to which the volume does not decrease. The 2 liquid type thing which consists of A liquid and B liquid is one of those are solidified by the reaction although it is liquefied at the time of impregnation. When an example is given, fibrin GRU (a trade name, Beriplast, Tisseel, etc.), the solution mold infusion (a trade name, ADEROKKU No. 1, and the Sanko pole US —) of a water glass system cement, such as Sekisui LG-3 and the MG lock No. 1, and the half-suspension mold infusion (a trade name —) of a water glass system The suspension mold infusion (a trade name, MC-1 No., a stop cleat, DENKA ES, etc.) of cement systems, such as SGR-7 No., \*\*\*\* No. 3, the Sanko pole L, and MS-1, hardenability synthetic resin, its curing agent (an epoxy resin and its curing agent), etc. can be mentioned. If a solid-sized agent is made little and poured in about the above-mentioned two liquid each type bulking agent, the infusion in balun is not solidified but remains in liquefied for a long period of time or gel.

[0006] This invention is explained with reference to a drawing. Drawing 3 expresses the condition of having fixed the internal-fixation mold artificial blood vessel which shows one example of this invention in the blood vessel with an aneurysm part. As for an artificial blood vessel body and 2, 1 is [ a hard cylinder member and 3 ] baluns, 4 is a blood vessel wall and 5 is the aneurysm part of a blood vessel. There is a thing like drawing 4 as a mode filled up with a bulking agent in balun. The edge of the internal-fixation mold artificial blood vessel of this invention is inserted in the edge of a blood vessel wall 4, the measurement section of a pressure gage 7 is inserted between the baluns 3 and the blood vessel walls 4 which were established subsequently to the peripheral surface of the hard cylinder member 2, and it pours in into balun 3, noticing 2 liquid type bulking agent about the graduation of a pressure

gage using two transfer pipets 6. Drawing 5 shows another type of this invention which becomes each edge of the artificial blood vessel 1 which branches from the hard cylinder member 2 and balun 3, respectively. When an abdominal aneurysm has attained to the common iliac artery on either side, the artificial blood vessel of such a Y character mold becomes effective. Drawing 6 is an internal-fixation mold artificial blood vessel which shows one example of the 2nd this invention and has many hard cylinder members 2 with balun 3 other than the both ends of an artificial blood vessel body. In the case of the aneurysm of thick and short range, such as an ascending aorta phyma and a pars-descendens-aortae phyma, if supplementary immobilization of the balun of both ends is carried out from the outside of the blood vessel so that it may be hard to move the artificial blood vessel after an operation, a safer operation will be attained. Drawing 7 can show other use modes of this invention, can bind lightly hard cylinder member with balun 3 2 parts of a blood vessel 4 and an internal-fixation mold artificial blood vessel with yarn or a wire, and can make both binding still firmer. [0007]

[Effect] If the internal-fixation mold artificial blood vessel of this invention is used, adhesion is strong to the aneurysm circumference, and little [ even when exfoliation is difficult / make / the excision part of a blood vessel ] operation is possible, and an operation can be made to finish for a short time.

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## DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] It is the schematic diagram showing the conventional-type treatment approach using the conventional artificial blood vessel.

[Drawing 2] It is the schematic diagram showing other conventional-type treatment approaches using the conventional artificial blood vessel.

[Drawing 3] an aneurysm part — 1 of this invention — it is the schematic diagram of the operation result of having inserted the concrete internal-fixation mold artificial blood vessel.

[Drawing 4] It is the schematic diagram of the operation approach using the

internal-fixation mold artificial blood vessel of this invention.

[Drawing 5] The schematic diagram of other concrete internal-fixation mold artificial blood vessels of this invention is shown.

[Drawing 6] The schematic diagram of the concrete internal-fixation mold artificial blood vessel of another others of this invention is shown.

[Drawing 7] It is the schematic diagram of another operation approach using the internal-fixation mold artificial blood vessel of this invention.

[Description of Notations]

1 Artificial Blood Vessel Body

2 Hard Cylinder Member

3 Balun

4 Blood Vessel Wall

5 Aneurysm Part of Blood Vessel

6 Transfer Pipet

7 Pressure Gage

8 Yarn or Wire

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**Abstract of JP5161665**

**PURPOSE:** To provide the internal fixing type artificial blood vessel which can be easily bonded to a blood vessel to be bonded even if the blood vessel is slightly damaged or slightly inflamed and the set for transplantation using this artificial blood vessel.

**CONSTITUTION:** The internal fixing type artificial blood vessel consists of an artificial blood vessel body,  $\geq 1$  hard cylindrical members provided at its end and arbitrary points at need and a tube provided on the cylindrical members. The set for transplantation including this artificial blood vessel is provided.

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(54) 【発明の名称】 内固定型人工血管およびそれを含む移植用セット

(57) 【要約】

【目的】 人工血管と結着すべき血管が多少損傷していても、あるいは多少炎症していても簡単に結着することのできる内固定型人工血管およびそれを使用した移植用セットの提供。

【構成】 人工血管本体、その端部および必要に応じて任意個所に設けられた1つ以上の硬質円筒部材および前記円筒部材上に設けられたチープよりなることを特徴とする内固定型人工血管ならびにそれを含む移植用セット。



## 【特許請求の範囲】

【請求項1】 人工血管本体、その端部に設けられた硬質円筒部材および前記円筒部材上に設けられたバルーンよりなることを特徴とする内固定型人工血管。

【請求項2】 人工血管本体、その端部および任意個所に設けられた硬質円筒部材および前記円筒部材上に設けられたバルーンよりなることを特徴とする内固定型人工血管。

【請求項3】 請求項1および/または2記載の内固定型人工血管、前記バルーンに充填剤を注入するための注入器および前記充填剤よりなる内固定型人工血管移植用セット。

## 【発明の詳細な説明】

## 【0001】

【産業上の利用分野】 本発明は、血管の内側に人工血管を挿入して、前記人工血管を血管に完全に結着するための内固定型人工血管およびそれを使用するための移植用セットに関するものである。

## 【0002】

【従来技術】 従来、血管と人工血管を結着する手段としては、第一に血管と人工血管を縫合する方法（図1参照）、第二に端部に硬質円筒部材を有する人工血管を血管内に挿入し、その上から糸または針金で結束する方法（図2参照）である。しかし、いずれの方法も人工血管と縫合あるいは結束しようとする血管周囲を剥離しなければならない。血管が脆弱であったり、あるいは炎症・感染を生じている場合には血管壁の剥離がうまく行えず、縫合、結束が困難となる場合が多い。

## 【0003】

【目的】 本発明の目的は、人工血管と結着すべき血管が多少損傷していても、あるいは多少炎症・感染していても簡単に結着することのできる内固定型人工血管およびそれを使用した移植用セットを提供する点にある。

## 【0004】

【構成】 本発明の第1は、人工血管本体、その端部に設けられた硬質円筒部材および前記円筒部材上に設けられたバルーンよりなることを特徴とする内固定型人工血管に関する。本発明の第2は、人工血管本体、その端部および任意個所に設けられた複数の硬質円筒部材および前記円筒部材上に設けられたバルーンよりなることを特徴とする内固定型人工血管に関する。本発明の第3は、前記内固定型人工血管、前記バルーンに充填剤を注入するための注入器および前記充填剤よりなる内固定型人工血管移植用セットに関する。

【0005】 本発明で使用する人工血管には格別の制限はなく、テフロン、ダクロン（商品名）、ゴアテックス（商品名）など現在使用されているいずれの人工血管でも使用できる。その端部に結合している硬質円筒部材についても格別の制限はなく、現在使用されているいずれの円筒部材も使用できる。前記バルーンは、本発明の重

要部材であり、このバルーン内に注入器によって充填剤が注入されたとき、バルーンが充填剤によって膨張し、血液が漏れない程度であつてかつ血管を破損しない程度に血管の内壁に圧着する作用をするものである。バルーンの前記硬質円筒部材側は任意の手段で固定されていることが好ましい。例えば適当な接着剤により接着することができる。バルーンの構成材料としては、バルーンが前記膨張に充分耐えるものであればよく、例えば、天然あるいは合成ゴムなどを使用することができる。合成ゴムとしては、ブタジエン、イソプレンなどのジエン系モノマーの重合または共重合体、SBRのような前記ジエン系モノマーとスチレンなどのオレフィン系モノマーとの共重合体、シリコン系ゴム、ポリウレタンおよびこれらのふつ素原子含有ゴムなどを挙げるができる。とくにこれらの材料と血液が接触したとき、血液の凝固を発生する恐れのないものがこのましい。前記充填剤としては、注入時に液状であり、万が一血液と接触しても毒性を示さないものであれば、とくに制限はない。たとえば注入時も使用時も液状のものでよいし、注入時は液状であっても使用時はゲル状あるいは固体状のものでよい。この場合は液状のときよりゲル状や固体状のときの方が体積が減少しないものを選択することが大切である。注入時に液状であるが反応により固体化するものとしては、A液とB液よりなる二液型のものがある。具体例を挙げると、フィブリングルー（商品名、ペリプラスト、ティシールなど）、水ガラス系の溶液型注入剤（商品名、アデロック1号、サンコーボールUS、セキスイルG-3、MGロック1号など）、セメント、水ガラス系の半懸濁型注入剤（商品名、SGR-7号、岩水3号、サンコーボールL、MS-1など）、セメント系の懸濁型注入剤（商品名、MC-1号、ストップクリート、デンカESなど）、硬化性合成樹脂とその硬化剤（エポキシ樹脂とその硬化剤）等を挙げるができる。上記の各二液型充填剤に関し、固型化剤を少量にして注入すれば、バルーン内の注入剤は固体化せず、長期間液状またはゲル状でとどまっている。

【0006】 本発明を図面を参照して説明する。図3は、本発明の1例を示す内固定型人工血管を動脈瘤部分をもつ血管内に固定した状態を表明している。1は人工血管本体、2は硬質円筒部材、3はバルーンであり、4は血管壁、5は血管の動脈瘤部分である。バルーン内に充填剤を充填する態様としては、図4のようなものがある。血管壁4の端部に本発明の内固定型人工血管の端部を挿入し、ついで硬質円筒部材2の周面に設けられたバルーン3と血管壁4の間には圧力計7の計測部を挿入し、2つの注入器6を用いて2液型充填剤を圧力計の目盛に注意しつつバルーン3内に注入する。図5は、枝分かれしている人工血管1の各端部にそれぞれ硬質円筒部材2およびバルーン3よりなる本発明のもう1つのタイプを示す。腹部大動脈瘤が左右の股腸骨動脈におよんで

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いる場合、このようなY字型の人工血管が有効となる。図6は、第2の本発明の一具体例を示すものであり、人工血管本体両端部の他に多数のバルーン3付き硬質円筒部材2をもつ内固定型人工血管である。上行大動脈瘤、下行大動脈瘤など、太くて短い範囲の動脈瘤の際、手術後人工血管が移動しにくいように、両端部のバルーンを血管外から補足固定するとより安全な手術が可能となる。図7は、本発明の他の使用態様を示すものであり、血管4と内固定型人工血管のバルーン3付き硬質円筒部材2部分を糸または針金で軽くしばり、両者の結着を一層強固なものとすることができる。

【0007】

【効果】本発明の内固定型人工血管を使用すれば、動脈瘤周辺に癒着が強く、剥離が困難な時でも、血管の切除部分ができるかぎり少ない手術が可能であり、また、手術を短時間で終わらせることができる。

【図面の簡単な説明】

【図1】従来の人工血管を用いた従来型処置方法を示す概略図である。

【図2】従来の人工血管を用いた他の従来型処置方法を

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示す概略図である。

【図3】動脈瘤部分に本発明の1具体的な内固定型人工血管を挿入した手術結果の概略図である。

【図4】本発明の内固定型人工血管を用いた手術方法の概略図である。

【図5】本発明の他の具体的な内固定型人工血管の概略図を示す。

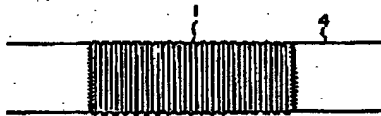
【図6】本発明のもう1つの他の具体的な内固定型人工血管の概略図を示す。

【図7】本発明の内固定型人工血管を用いたもう1つの手術方法の概略図である。

【符号の説明】

- 1 人工血管本体
- 2 硬質円筒部材
- 3 バルーン
- 4 血管壁
- 5 血管の動脈瘤部分
- 6 注入器
- 7 圧力計
- 8 糸または針金

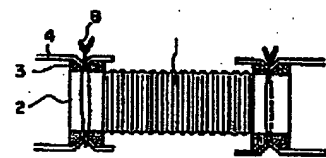
【図1】



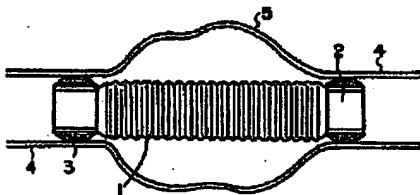
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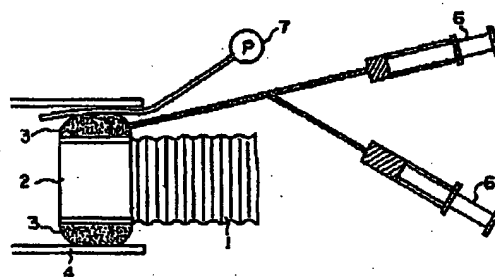
【図7】



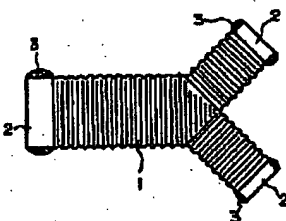
【図3】



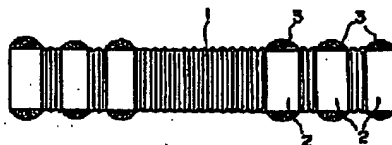
【図4】



【図5】



【図6】



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